

This Page Is Inserted by IFW Operations
and is not a part of the Official Record

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

IMAGES ARE BEST AVAILABLE COPY.

**As rescanning documents *will not* correct images,
please do not report the images to the
Image Problem Mailbox.**

What is Claimed is:

- [c1] A method of forming a resistor in a Fin structure comprising the steps of:
 - forming at least one vertically oriented semiconductor body having exposed vertical surfaces on a substrate;
 - implanting dopant ions into said exposed vertical surfaces of said at least one semiconductor body off-axis at a concentration and energy sufficient to penetrate into said exposed vertical surfaces of said at least one semiconductor body without saturation; and
 - forming contacts to said at least one semiconductor body.
 - [c2] The method of Claim 1 wherein said at least one vertically oriented semiconductor body is formed via lithography and etching.
 - [c3] The method of Claim 1 wherein said at least one vertically oriented semiconductor body has a hard mask present atop a horizontal surface.
 - [c4] The method of Claim 1 further comprising forming a mask on an exposed surface of the substrate prior to performing said implanting step.
 - [c5] The method of Claim 1 wherein said dopant ions are subjected to an activation annealing step prior to forming said contacts to diffuse dopant ions within said vertical surfaces.
 - [c6] The method of Claim 1 wherein, prior to forming said contacts, a patterned mask is formed over portions of said at least one vertically oriented semiconductor body while leaving end portions of said body exposed.
 - [c7] The method of Claim 1 wherein said contacts are formed by ion implantation, silicidation, or a combination of ion implantation and silicidation.
 - [c8] The method of Claim 1 further comprising forming connectors to said contacts.
 - [c9] A method of controlling the resistance of a plurality of vertically oriented semiconductor bodies comprising the steps of:
 - forming a structure having a plurality of vertically oriented semiconductor bodies on a substrate, each of said bodies having exposed vertical surfaces and differing widths; and
 - implanting dopant ions off-axis into said plurality of vertically oriented semiconductor bodies at a concentration and energy sufficient to penetrate into exposed vertical

surfaces of said plurality of vertically oriented semiconductor bodies without saturating each semiconductor body.

- [c10] The method of Claim 9 further comprising a step of activation annealing said dopant ions to diffuse said dopant ions within each exposed vertical surface of the semiconductor bodies, wherein after said activation annealing thicker semiconductor bodies have a first dopant concentration and thinner semiconductor bodies have a second dopant concentration, said first dopant concentration is lower than said second dopant concentration.
- [c11] A Fin structure comprising:
a structure having at least one vertically oriented semiconductor body present thereon, wherein said at least one vertically oriented semiconductor body has vertical surfaces; a doped region present in said at least one vertically oriented semiconductor body that extends inward from said vertical surfaces; and contacts present on outer portions of said at least one vertically oriented semiconductor body, wherein said doping region and said contacts are of the same dopant type thereby providing a resistor in said at least one vertically oriented semiconductor body.
- [c12] The Fin structure of Claim 11 wherein said at least one vertically oriented semiconductor body is comprised of single crystalline Si or SiGe.
- [c13] The Fin structure of Claim 11 wherein said at least one vertically oriented semiconductor body has a hard mask present atop a horizontal surface.
- [c14] The Fin structure of Claim 11 wherein said at least one vertically oriented semiconductor body has a patterned masking layer thereon, said patterned masking layer not covering said contacts.
- [c15] The Fin structure of Claim 14 wherein said patterned masking layer is comprised of a conductive material.
- [c16] The Fin structure of Claim 15 wherein said patterned masking layer is comprised of a non-conductive material.
- [c17] The Fin structure of Claim 11 wherein said resistor is replaced with a diode.

- [c18] The Fin structure of Claim 17 wherein said diode includes said contacts that are of opposite dopant style.
- [c19] The Fin structure of Claim 17 where said diode includes said contacts wherein one of the contacts comprises a doped region having a conductivity type dopant which is different from said dopant region and the other contact is a silicide.